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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/604,796	06/27/2000	Kyeong Jin Kim	8733.20134	4009

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MCKENNA LONG & ALDRIDGE LLP  
1900 K STREET, NW  
WASHINGTON, DC 20006

EXAMINER

RUDE, TIMOTHY L

ART UNIT PAPER NUMBER

2871

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Applicati n No.

09/604,796

Applicant(s)

KIM ET AL.

Examiner

Timothy L Rude

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claims*

1. Claims 1 and 20 are amended necessitating new grounds of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (Yamada) USPAT 6,344,883, Onishi et al (Onishi) USPAT 5,844,643, and Colgan et al (Colgan) USPAT 6,256,080 B1.

As to claims 1-4, 7, 20, and 26-29, Yamada discloses [Figure 15 that is a variation of Figures 10A-10D (col. 19, line 40 through col. 27, line 35)] a multi-domain liquid crystal display device comprising:

first and second substrates [32 and 34] facing each other and having a pixel region [pixel region];

a liquid crystal layer [42] between the first and second substrates;

a first dielectric frame [36, (OMR83, col. 26, lines 45-62)] on one side of the pixel region [pixel region in 10C];

a second dielectric frame [36, (OMR83, col. 26, lines 45-62)] on one side of the pixel region [pixel region in 10C]; and

a dielectric protrusion [dielectric convex portion, 69, Figure 15 (col. 26, lines 45-62)] between the first and second dielectric frame;

wherein said first and second dielectric frames distort electric field applied to the liquid crystal layer [inherent to dielectric material, OMR83, per Onishi], and an alignment layer, 38a and 38b, on at least one substrate between said first and second substrates.

Note: The use of a dielectric material such as OMR83 for distorting the electric field was well known to those having ordinary skill in the art of liquid crystals at the time the claimed invention was made, however, in support of the fact that OMR83 is a dielectric that causes distortion of applied electric fields in LCD with liquid crystal material having negative dielectric anisotropy, Onishi is cited. Onishi [Figures 8 and 9C, col. 20, lines 30-42 and col. 28, lines 8-19] discloses the use of OMR83 structures to create multi-domain effects wherein the LC layer thickness is not greatly reduced and where reduced layer thickness is not cited as a causal effect. The OMR83 structures of Onishi are considered to be functionally the same as those of Applicant, and they are considered to confirm the structures of Yamada do distort the electric field.

Therefore, Yamada discloses a first dielectric frame on one side of the pixel region; a second dielectric frame on another side of the pixel region; and a dielectric protrusion between the first dielectric frame and the second dielectric frame.

Yamada does not explicitly disclose a second dielectric frame which extends from the first substrate to the second substrate and/or acts as a spacer.

Colgan teaches in Figures 21A-24 that a ridge, 706, 720, or 724 (Applicant's dielectric frame and/or insulating protrusion), for pretilt control (Abstract, col. 3, lines 34-51, col. 6, lines 49-53, and col. 7, lines 29-57) may be used as spacers (instead of other spacers, 726, or with spacers, 726) to form the appropriate cell gap, G (col. 15, lines 12-33).

Colgan is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to extend the dielectric frame and/or insulating protrusion to the opposed substrate to serve as a spacer to establish the appropriate cell gap.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Yamada with the dielectric frame/insulator extended to the opposed substrate of Colgan to serve as a spacer to establish the appropriate cell gap.

As to claims 9-11, 14-19, 21-25, and 34, mere duplication of parts is not patentably distinct unless unexpected results are obtained Yamada in view of Onishi and Colgan disclose the claimed invention except for duplication of dielectric structures. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add additional dielectric structures to provide more distortion of

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electric fields to enhance liquid crystal tilt and thereby improve viewing angle performance, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

As to claim 13, it is well known in the art of liquid crystals to divide a pixel into a plurality of independently driven regions in order to provide for independent control of red, green, and blue to comprise a color display.

As to claims 5, 6, 8, 12, 30-33, and 35-37, rearrangements of parts the invention disclosed by Yamada in view of Onishi and Colgan and are therefore not patentably distinct. It would have been obvious to one having ordinary skill in the art at the time the invention was made to rearrange dielectric structures to provide better distortion of electric fields to enhance liquid crystal tilt and thereby improve viewing angle performance, since it has been held that rearrangement of parts of an invention involves only routine skill in the art.

3. Claims 1-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (Yamada) USPAT 6,344,883, Onishi et al (Onishi) USPAT 5,844,643, and Kondo et al (Kondo) USPAT 5,726,728.

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As to claims 1-4, 7, 20, and 26-29, Yamada discloses [Figure 15 that is a variation of Figures 10A-10D (col. 19, line 40 through col. 27, line 35)] a multi-domain liquid crystal display device comprising:

- first and second substrates [32 and 34] facing each other and having a pixel region [pixel region];

- a liquid crystal layer [42] between the first and second substrates;

- a first dielectric frame [36, (OMR83, col. 26, lines 45-62)] on one side of the pixel region [pixel region in 10C];

- a second dielectric frame [36, (OMR83, col. 26, lines 45-62)] on one side of the pixel region [pixel region in 10C]; and

- a dielectric protrusion [dielectric convex portion, 69, Figure 15 (col. 26, lines 45-62)] between the first and second dielectric frame;

wherein said first and second dielectric frames distort electric field applied to the liquid crystal layer [inherent to dielectric material, OMR83, per Onishi], and an alignment layer, 38a and 38b, on at least one substrate between said first and second substrates.

Note: The use of a dielectric material such as OMR83 for distorting the electric field was well know to those having ordinary skill in the art of liquid crystals at the time the claimed invention was made, however, in support of the fact that OMR83 is a dielectric that causes distortion of applied electric fields in LCD with liquid crystal material having negative dielectric anisotropy, Onishi is cited. Onishi [Figures 8 and 9C, col. 20, lines 30-42 and col. 28, lines 8-19] discloses the use of OMR83 structures to create multi-domain effects wherein the LC layer thickness is not greatly reduced and

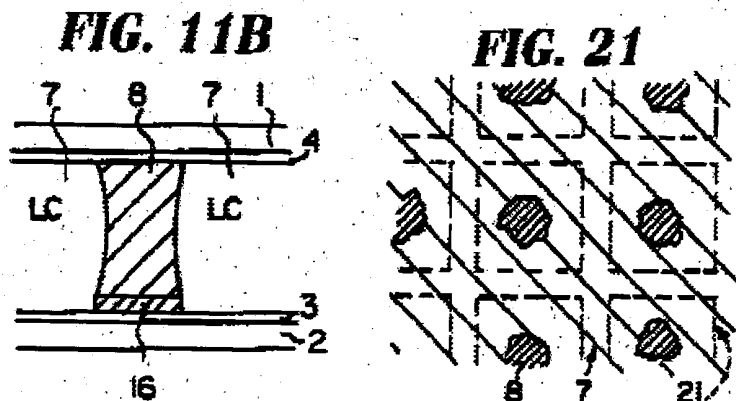
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where reduced layer thickness is not cited as a causal effect. The OMR83 structures of Onishi are considered to be functionally the same as those of Applicant, and they are considered to confirm the structures of Yamada do distort the electric field.

Therefore, Yamada discloses a first dielectric frame on one side of the pixel region; a second dielectric frame on another side of the pixel region; and a dielectric protrusion between the first dielectric frame and the second dielectric frame.

Yamada does not explicitly disclose a second dielectric frame which extends from the first substrate to the second substrate and/or acts as a spacer.

Kondo teaches in Figures 11B and 21 [col. 35, lines 35-55] that the polymeric walls [8, Figures 11B and 21] may be reversed such that said polymeric wall is formed in the central portion of each pixel [Figure 21] to obtain energetic stability [good multi-domain liquid crystal molecular arrangement and consequently good display performance].



Kondo is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use centrally located dielectric protrusions [8,



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polymeric walls] to obtain energetic stability [good multi-domain liquid crystal molecular arrangement and consequently good display performance].

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Yamada with centrally located dielectric protrusions of Kondo to obtain energetic stability for good multi-domain liquid crystal molecular arrangement and consequently good display performance.

As to claims 9-11, 14-19, 21-25, and 34, mere duplication of parts is not patentably distinct unless unexpected results are obtained. Yamada in view of Onishi and Kondo disclose the claimed invention except for duplication of dielectric structures. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add additional dielectric structures to provide more distortion of electric fields to enhance liquid crystal tilt and thereby improve viewing angle performance, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

As to claim 13, it is well known in the art of liquid crystals to divide a pixel into a plurality of independently driven regions in order to provide for independent control of red, green, and blue to comprise a color display.

As to claims 5, 6, 8, 12, 30-33, and 35-37, rearrangements of parts the invention disclosed by Yamada in view of Onishi and Kondo and are therefore not patentably distinct. It would have been obvious to one having ordinary skill in the art at the time the invention was made to rearrange dielectric structures to provide better distortion of electric fields to enhance liquid crystal tilt and thereby improve viewing angle performance, since it has been held that rearrangement of parts of an invention involves only routine skill in the art.

#### ***Response to Arguments***

4. Applicant's arguments filed on 12 January 2004 have been fully considered but they are not persuasive.

#### **Applicant's ONLY arguments are as follows:**

(1) None of the cited references combine to teach a dielectric protrusion extending from the first substrate to the second substrate between the first dielectric frame and the second dielectric frame.

(2) Yamada teaches away.

(3) Yamada teaches the use of an additional spacer, 65.

#### **Examiner's responses to Applicant's ONLY arguments are as follows:**

(1) It is respectfully pointed out that Yamada teaches the centrally located dielectric frame and Colgan teaches the use of such frames as spacers with motivation

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to combine per rejection above. Also, Yamada cites Japanese Laid-open Publication No. 6-308496 that teaches the use of centrally located polyimide spacers (col. 3, lines 7-20).

(2) It is respectfully pointed out that the references must be considered for all they would teach to those of ordinary skill in the art. Colgan teaches the use of dielectric frames as spacers with motivation to combine per rejection above. Yamada does not teach that such a combination would fail to work and Colgan teaches it works.

(3) It is respectfully pointed out that the references must be considered for all they would teach to those of ordinary skill in the art. Yamada discloses the spacers, 65, are polyimide which is also a dielectric. Colgan teaches the use of dielectric frames as spacers (without additional spacers) with motivation to combine per rejection above.

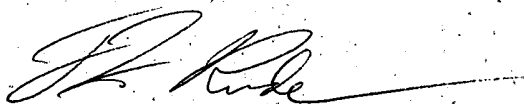
Applicant has not argued rationale for obviousness rejections for claims 5, 6, 8-19, 21-25, and 30-37 and has thereby acquiesced. See also IDS JP2000075275.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Monday through Thursday.

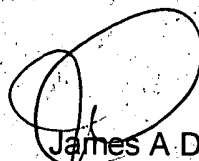
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



tlr

Timothy L Rude  
Examiner  
Art Unit 2871



James A Dudek  
Primary Examiner  
Art Unit 2871